

## REMARKS

### Claim Rejections Under 35 USC § 112, first paragraph

The Office Action rejects claim 21 as allegedly failing to comply with the written description requirement. The reason provided is that “there is no support in the original disclosure for the use of noble metal ore when mixed with the LCD components.

Page 11, first paragraph recites

Particular preference is given to the use of the LCDs in the recovery of noble metals from compositions comprising a mixture of non-noble and noble metals. These compositions can be either naturally occurring products, such as, for example, ores, ... (Emphasis added.)

Moreover, original claim 21 (which is part of the original disclosure) also clearly conveys that applicants were in possession of the claimed invention by reciting

Use of LCDs according to Claim 20, characterised in that the LCDs are employed in the recovery of noble metals from ores. (Emphasis added.)

See also the disclosure on page 9, third paragraph reciting

A further advantage of this embodiment is the fact that the plastic films present in the LCDs can be employed as reducing agent in order to reduce the metal-containing products. In the reductive melting of metal-containing ores or products for the recovery of crude metals, carbon-containing products, such as, for example, coal, are generally added. This is because the metals would be oxidised at the high melt temperatures without the addition of reducing agents and would first have to be reduced back to metals in an additional production step. The use of the carbon-containing plastic films present in the LCDs thus enables at least some, preferably all, of the carbon-containing products usually added as reducing agent in this process to be replaced or saved. (Emphasis added.)

The above clearly conveys to one of ordinary skill in the art that applicants were at the time of filing in possession of the claimed matter.

### Claim Rejections Under 35 USC § 102

Sumimoyo et al. describe a process for the recycling of LCDs [0001]. It is also correct, as stated in the Office Action, “the LCD materials are heated such that pyrolysis happens between 873 and 923 K.” This temperature range corresponds to 600-650°C. Please

note that in this temperature range neither the glass nor the metals fuse, as explicitly stated in the specification of Sumimoyo et al. (“LCD equipment products, such as glass, an aluminium containing alloy, copper, and gold, does not fuse”, [0019]). Thus, contrary to the allegations, the materials in the mixture do not melt. Indeed, at the end of paragraph [0020], Sumimoyo explicitly teaches away by teaching that “it is necessary to make it below the temperature that neither glass nor metal fuses.”

The process as claimed in pending claim 1 of the present application differs from the process of Sumimoyo et al. significantly because in the process of the present claims (and even before amendments), the mixture is melted. To melt the mixture, significantly higher temperatures than used in the process of the prior art document are necessary. Thus, for this reason even, the claims were not anticipated.

Nevertheless, to even more explicitly distinguish, applicants’ introduce into claim 1 the feature of previously pending claim 2, according to which “the LCD-containing mixture is melted at a temperature range of 900 to 1700°C, which is significantly higher than the temperature range of Sumimoyo et al. (600 to 650°C). This amendment does not raise new issues, and as such, the entry of it is respectfully and courteously requested.

Furthermore, Sumimoyo et al. only describe the recycling of the LCDs itself, which means that it is only described to recover e.g., the metals of the LCDs.

In contrast to the disclosure of Sumimoyo et al., the process of the present claims is directed to a process which the LCDs, which itself contain electronic components (as described in the specification of the present application, page 5, lines 4 to 8) are mixed with a composition that comprises a mixture of noble and non-noble metals. Consequently, according to the process of the present application, not only the metals of the LCDs are recovered and separated, but also the LCDs are used as materials for the separation of noble metals from non-noble metals contained in mixtures containing noble and non-noble metals.

Therefore it is stated in pending claim 1 that the LCDs are mixed with a composition that comprises a mixture of noble and non-noble metals. Such a process is also clearly described in the working examples of the present application (Example 2). As can be seen from Table 1 (page 13), the LCDs are mixed with “metal scrap,” which is a mixture containing noble and non-noble metals. The content of the LCDs in the mixtures is between 6.25% by weight (Experiment 1) and 28.125% (Experiment 5). It is disclosed in the specification of the present application (page 7, lines 17-18) that “the proportion of LCDs in the mixture as a whole is preferably in the range from 5 to 50% by weight”. In this regard

herewith filed is a new dependent claim containing this feature. This new claim does not raise new issues, but merely recites a narrower embodiment of the already examined matter. Accordingly, the entry of it is respectfully requested.

The process of the present claims differ significantly from the process as disclosed in Sumimoyo et al., and are not obvious in view thereof.

Claim 2 is rejected over Kaida (see rejection on page 7 of Office Action). However, all reasons provided make it apparent that the rejection is indeed over Sugimoyo.

The Office Action alleges that it would have been obvious to combine the gasification and pyrolysis steps together in Sugimoyo and thereafter to choose the optimal range of process temperatures through routine experimentation.

However, Sugimoyo explicitly teaches away from such by clearly teaching in paragraph 20 (as noted above) for the pyrolysis step that “it is necessary to make it below the temperature that neither glass nor metal fuses.” As such, combining these steps and raising the temperature as alleged to be obvious by the Office Action is clearly and explicitly contrary to the teaching of Sugimoyo. As such, it cannot be obvious based on the disclosure of this reference, as its directly contrary to its explicit teachings.

The use of 1573 K is taught only for the detoxification of the gas generated from the pyrolysis, see paragraph [0023] teaching that “exhaust gas after combustion will also be detoxicated.” This temperature is not in any way suggested for the pyrolysis step, and instead is taught against for such step.

Claims 7 and 9 are rejected as allegedly anticipated by Kaida. Claims 7 and 9 are made dependent on claim 1, which is not rejected over this reference. As such, the rejection is readily moot. For the same reasons for which claim 1 should be patentable, now dependent claims 7 and 9 should be patentable too.

Regarding claims 10-11 (and possibly 12 since it is now made again dependent on claim 10), please consider the following.

The Office Action alleges that “applicants arguments with respect to the prior art rejections of the claims have been considered but are moot in view of the new ground(s) of rejection.” However, the rejection has not changed at all, indeed the allegations regarding why the combination of the cited references is obvious appears to be merely pasted into the

new Office Action from the previous one, which new Office Action is made final. Thus, these claims have not been rejected on new grounds at all.

Moreover, no reason is provided why the rejection is maintained, and there is no indication to applicants in any direction how to advance prosecution. The amendments to claims 10 and 11 did not raise any new issues, as clearly no new allegations are made at all regarding why they are still considered obvious. As such, the rejection should not have been maintained in a final rejection without at least some explicit reasons provided for the maintenance thereof. Applicants respectfully request a clarification.

The thermal treatment of LCDs in a rotary-tube furnace at a temperature of 1100 to 1300°C results in the formation of a protective film on the chamotte lining. In this way, it is possible to employ LCDs in rotary-tube furnaces as replacement materials for purchased silicate-containing products, such as, e.g. furnace sand, as stated in the specification of the present application (page 10, lines 5-9). This result can only be achieved in a rotary-tube furnace and not in a “normal” furnace, as disclosed in Kaida et al. This result is also not obvious with respect to the combination of Kaida et al. with Gaedcke et al., because Gaedcke et al. only disclose a rotary furnace, which is known per se. But, no reasons are present whatsoever for the combination. There is nothing in the prior art rendering the use of such a furnace obvious in the process of the present claims. Consequently, also pending claim 10 together with its dependent claim should be allowable.

As discussed above, making the combination of these references to achieve the presently claimed invention is not obvious to one of ordinary skill in the art.

The first reference to Kaida teaches the disposal of LCDs by feeding to a nonferrous smelting furnace. The objective is to eliminate or destroy the product, i.e., incinerate.

The secondary reference US '403 has nothing to do with LCDs, or the elimination or recycling of product, or with any issues or problems of concern in the primary reference. Instead, it relates to pigments and teaches that in certain types of furnaces the “processes have the disadvantage that they make it very difficult to obtain a consistent quality of product, since it is virtually impossible to obtain a uniform temperature over the entire layer thickness.” To solve this problem, rotary furnaces are proposed as they do not have the above disadvantages.

However, no such issues discussed in US '403 are present in Kaida. There is no product that needs to be of consistent quality. The uniformity of the temperature is not even remotely a consideration. As such, one of ordinary skill in the art would find the disclosure

of US '403 completely irrelevant to anything in Kaida. As such, one of ordinary skill in the art would not have a reason to combine these references.

For a combination of references to render a claimed invention obvious, there must be some reason for the combination. It is not enough that a combination of prior art references disclose all of the elements of an invention. See *In re Jones*, 958 F.2d 347, 21 USPQ 2d 1941 (Fed. Cir. 1992). The facts of *Jones* are particularly relevant here. In *Jones*, the primary reference taught dicamba in its free acid, ester, and salt forms as herbicides, which was combined with two secondary references teaching substituted ammonium salts made from a known amine. The PTO position was that one skilled in the art would have been motivated to use, with dicamba, substituted ammonium salts made from the known amine, and would have expected such a salt to have herbicidal activity. The Federal Circuit disagreed stating “before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” Not finding motivation, the PTO was reversed.

The situation is similar here. Even if the combination would lead to the claimed invention, which is not admitted, without any reason within the grasp of one of ordinary skill in the art to make the combination, there cannot be obviousness.

Claim 12 is rejected as allegedly anticipated by Kaida. Claim 12 is made dependent on claim 10, which is not rejected over this reference. As such, the rejection is readily moot. For the same reasons for which claim 10 should be patentable, now dependent claim 10 should be patentable too.

Any dependent claims not specifically addressed are patentable for at least the reasons for which the claims they depend on are also patentable.

Reconsideration is respectfully and courteously requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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